# PLANT DISEASE NOTES

## FIELD AND FODDER CROPS.

### LUCERNE DISEASES IN THE HUNTER VALLEY:

A survey of lucerne crops between Maitland and Scone was carried out in September, 1952. The most serious disease observed was that caused by the stem nematode *Ditylenchus dipsaci*. A severe outbreak of this disease was recorded in 1925 and, although it has been recorded regularly since then, little is known of its extent and severity over the years. On this occasion it was recorded on about one-third of the farms visited and appeared to have been favoured by wet conditions. The percentage of diseased plants in affected stands ranged from much less than one up to almost 100, and several crops had been so thinned as to make them unprofitable.

No sign of the stem nematode disease was observed in clover and medic plants, which are considered to be possible alternate hosts, even when they were growing in severely affected stands of lucerne; furthermore, no nematodes were detected in specimens examined in the laboratory.

Of the other lucerne diseases present, downy mildew (*Peronospora trifoliorum*) was the most serious, particularly in crops which had been left too long before cutting. The leaf spot caused by *Pseudopeziza medicaginis* was causing damage under similar conditions. Black stem (*Ascochyta imperfecta*) and unidentified crown rots were also present but were of little importance. Occasional plants showing mosaic symptoms were observed.

Department of Agriculture,
Sydney.

- P.G. VALDER.

## VEGETABLES.

### FUSARIUM FOOT ROT OF CUCURBITS:

A destructive foot rot caused by the fungus *Fusarium solani* (Mart.) App. & Wr. form *cucurbitae* (Snyder and Hansen) has been present in cucurbit crops in the coastal areas of N.S.W. since 1945 and was recorded from the central western slopes in 1951. In the field only pumpkin, squash and marrow have been found affected, the symptoms being similar to those described on squashes by Gries (Conn. A.E.S. Bull. 500).

In glasshouse inoculation tests, one isolate has been shown to attack also watermelon, citron, rockmelon and cucumber, although there is some evidence of resistance in rockmelon and cucumber.

The fungus has been shown to be both externally and internally borne in pumpkin seed (var. Queensland Blue) produced on the north coast of this State.

Recently, in the Richmond-Windsor area, one crop of pumpkins was a total loss due to foot rot and other pumpkin crops were affected to a lesser degree. These crops were growing on ground, previously free of this disease, which had been covered by floodwater in early spring. As the floods receded, rotted cucurbit fruits, presumably carrying the pathogen, were deposited on this ground, and the infection area was sharply delimited by the flood line.

Department of Agriculture,
Sydney.

- R. J. CONROY.

INCIDENCE OF SPOTTED WILT OF TOMATOES:

During early November a tomato crop of 3,000 vines of a mixed planting of Grosse Lisse and Red Cloud varieties growing at Somersby, N.S.W., began to develop spotted wilt. This crop had been sprayed regularly and thoroughly with D.D.T. emulsion thrice weekly both in the seed bed and after planting out in the field on 7th October.

From the time the first affected plants were noted by the grower on 9th November, until 23rd November, when preventive D.D.T. spraying was abandoned, 2,800 vines had been infected.

A survey was made of the weeds growing adjacent to the affected crop and a collection of thrips made for determination of the possible existence of the vector thrips. *Thrips imaginis*, *Thrips tabaci* and *Thrips (?) florum* were determined in large numbers. The vector insect *Thrips tabaci* was found exclusively on the weed plants *Solanum nigrum*, *Phytolacca octandra* and *Bidens pilosa*. During the day on which the specimens were collected, *T. tabaci*, both as nymphs and as adults, were found feeding and sheltering in the growing points of the weeds. Adult *T. tabaci* only were found alive in the growing points of healthy and infected tomato plants in the crop, three days after it had been thoroughly sprayed with 0.1% D.D.T. emulsion.

It is noteworthy that no other crop in the district was at that time, or subsequently, affected with spotted wilt. The weed host plants and nymphal T. tabaci are being tested for the presence of the virus.

Department of Agriculture,
Gosford, N.S.W.

- T.B. KIELY and
J.G. GELLATLEY

PARSNIP CANKER:

An epidemic of parsnip canker in the Melbourne vegetable area believed to be caused by the fungus Itersonilia Derx has been reported by the writer (A.P.D.R. 4 : 4 : 47).

The Victorian isolate has now been identified by Assoc. Professor R. E. Wilkinson, Cornell University, U.S.A., as the fungus Itersonilia. Professor Wilkinson also volunteered the following information in regard to the disease:-

> "In reply to your question regarding soil reaction, I must admit that I have little information. Early in our work we tried various soil treatments, including liming the soil. There was very little disease that year, but we felt that none of the treatments had any effect. Since then, we have considered that foliage infection serves as the main source of inoculum, so have done no more with soil treatments.
>
> We have found the parsnip canker can be materially reduced by protecting the leaves of the plants from infection. Fixed copper spray seemed quite effective. We also found that root infection could be reduced by a mechanical or chemical barrier. We used Tersan drench for a chemical barrier. A ridge of soil thrown over the crowns during cultivation was not as efficient, but was much cheaper and simpler".

Professor Wilkinson also advised that "the genus Itersonilia was erected by H. G. Derx in 1948. It is published in Bull. Bot. Gard. Buitenzorg, Ser. 111, 17 : 465-472. A recent article by L. S. Olive in Bull. Torrey Bot. Club 79 : 126-138, 1952, will bring you up to date on the little literature that there is".

Department of Agriculture,
Melbourne.

- L. L. STUBBS.

FRUIT.

WINTER YELLOWING OF CITRUS:

Rains in early March followed by a short period of very good growing weather stimulated autumn growth of N.S.W. citrus trees last year. This was most marked in trees 2-5 years old, which were not carrying fruit and in which earlier growth had been checked by the spring and summer drought. This autumn foliage was immature at the end of May when a sudden spell of very cold weather occurred throughout the State. As a result the leaves became quite yellow. Winter yellowing is a normal feature of late autumn growth, but this season the effect was much more severe because of the combination of the unusually late growing period and the sudden severe and rather early cold spell. Many young trees entered the winter period with all or most of their leaves completely yellow. By the spring many of these trees were found to be suffering from root rot, and their recovery has been slow. The root loss ranged from death of fibre roots to the death of more than half of the root system. When examined in October and November the roots of these trees were devoid of starch, in strong contrast to the roots of healthy trees and of trees suffering from Phytophthora root rot. No pathogen has been found. Trees on rough lemon, sweet orange, trifoliata and Cleopatra mandarin have been observed to show the condition, which is present in coastal and inland citrus areas, in all soil types. The severity of the effect is directly proportional to the amount and vigour of the autumn growth.

It is suggested that the photosynthetic activity of the bleached leaves must have been greatly restricted, and consequently during the winter the whole tree, and particularly the root system, became depleted in reserve food materials. Such prolonged starvation could be expected to result in the gradual death of roots.

Department of Agriculture,
Sydney.

- LILIAN R. FRASER.

AN UNFAMILIAR DISEASE OF CHERRIES:

During November and December 1952 several cases of a disease of cherries came to the notice of the Department. The first symptoms on the fruit developed when they were about half grown and appeared as yellowish areas with a reddish border, sometimes with concentric reddish rings within the affected area. Later the tissue collapsed giving rise to a sunken brown to dark brown pit. The collapsed tissue was dry and did not extend deeply into the flesh. Apparently associated with the

fruit symptoms was a brown necrotic spotting of the leaves. The spots were often very abundant and later fell from the leaves giving them a tattered appearance.

The cause of the condition has not been definitely determined. All attempts to isolate a fungal or bacterial pathogen were unsuccessful, and it is felt that the condition is probably due to a virus. In many respects the symptoms resemble those of "tatter leaf" as described by Willison and Berkeley (Phytopath. 36 : 73-84, 1946). A few leaves on the affected trees showed a faint mosaic pattern, which was one of the symptoms recorded by Willison and Berkeley. However, the fruit symptoms noted in Tasmania appear to be rather more severe, and to differ in other ways from the description given in their paper.

Department of Agriculture,
Hobart.

- G. C. WADE.

CONTROL OF BREAKDOWN IN STORED VINE CANES:

In the process of grafting wine vines on to Phylloxera resistant stocks, the stock wood is collected in June and stored until scion wood comes to hand at intervals during the pruning season.

This stock wood is bedded down in moist sand for periods as long as four months. During this storage in sand fungal breakdown of the bark occurs, rendering much of the wood useless for grafting. A number of fungicides were tried this year in an attempt to reduce this breakdown. The fungicide Phenyl Mercuric Fixtan gave excellent control as shown by the following table.

| Treatment | % Breakdown of Canes |
|---|---|
| Control | 90% |
| P.M.F. 1lb/100 galls. | 2% |
| SR.406 4lb/100 galls. | 27% |
| $H_2SO_4$ 10% dip | 80% |

Department of Agriculture,
Melbourne.

- R. H. TAYLOR

GRAPE MOULD CONTROL:

After a humid pre-harvest period Ohanez grapes are attacked by *Botrytis cinerea* during transit and storage. In an attempt to control this breakdown a spray plot was laid out on some vines grown on overhead trellises. This type of trellis was used because the bunches hang clear of the foliage and can be more easily sprayed than those of vines grown on the "fence" type trellis.

As Jenkins (A.P.D.R. 2 : 3 : 40, 1950) has already noted Zineb (Dithane Z78) has some ability to control grape mould.

The fungicides tested were:-

| | |
|---|---|
| 1. SR406 | 4lb/100 gallons |
| 2. Zineb (Dithane Z78) | 1½lb/100 gallons |
| 3. Phygon | 1lb/100 gallons. |

Phygon caused injury to the grapes, dark patches appearing on the calyx end of the berries. The other two sprays did not cause injury although both left a slight white residue on the berries.

The bunches were sprayed in January and again in March. After harvest in April they were stored at 32°F for five months. Three inspections were carried out, at two, four and five months after the beginning of storage.

At the second inspection it was apparent that Zineb was preventing breakdown. This was more marked at the final inspection when only 3% of the Zineb sprayed berries had broken down whereas the breakdown in the other boxes was approximately 80%.

Department of Agriculture,
Melbourne.

- R. H. TAYLOR.

CHLOROTIC PHYLLODY OF STRAWBERRY:

A strawberry disease of unknown cause, to which he gave the name chlorotic phyllody was described recently by Plakidas (P.D.R., 35:11:495-6) from Louisiana, U.S.A. The most prominent symptoms were chlorosis of the leaves without definite pattern, varying from pale green to bright yellow, and in the flowers transformation of the carpels to small leaves.

Plants with symptoms agreeing with these were received from Manilla, N.S.W. in the spring of 1951, and the grower stated that similarly affected plants had occurred in the previous season. The flower modification is suggestive of a virus of the big bud type, but the unusually bright chlorosis of the foliage is unlike anything produced by this virus in other plants.

Department of Agriculture,
Sydney.

- LILIAN R. FRASER.

ORNAMENTALS.

ROSE WILT VIRUS:

Over the past 12 years only a very few cases of typical rose wilt have been seen in N.S.W., but in the spring of 1952 the disease assumed almost epiphytotic proportions in nurseries, parks, and home gardens around Sydney. Its appearance in some isolated nurseries suggests an active vector and a source of virus other than roses. Only the floribunda roses appeared to show resistance to infection, although there were well marked variations in susceptibility amongst Pernettiana and hybrid tree roses.

Well established nursery and garden plants, after the initial severe shock reaction, produced growth of reduced vigour with pinched, hard yellowish foliage. Surveys of older plantings revealed that many plants, which had previously been of low vigour and had suffered from die-back, were showing rose-wilt symptoms.

The spring of 1952 was unusual in the number of spells of cold weather and the persistence of cool to cold night temperatures. It is thought possible that severe symptoms of rose wilt (leaf balling and abscission with die-back) may be best manifested under cool temperatures.

As the result of the survey it seems likely that the virus is more widespread in N.S.W. than previously suspected, that its typical symptoms are more or less masked under normal Sydney

spring and summer weather conditions, and that it is the cause of much of the die-back and hard pinched spring growth which are features of many older rose collections.

Department of Agriculture, Sydney. - LILIAN R. FRASER.

BACTERIAL BLIGHT OF ROSES:

During the spring of 1952 a number of specimens of diseased roses were submitted for examination. The characteristic feature was the failure of the petals to enlarge, so that mature blooms had petals which frequently did not exceed the length of the sepals. The margins of the affected petals were completely collapsed. Initially the affected tissue was soft and light brown, but later it dried out to a papery condition usually with darkening of the colour. In one of the cases investigated the leaves also exhibited small blackish-purple spots, sometimes with a greyish white centre, and always with a margin of watersoaked tissue.

Bacteria were present in large numbers in the affected areas, and were readily isolated in culture. The identity of the organism has not been established, but the literature records a similar trouble due to *Pseudomonas syringae*.

The disease was chiefly troublesome on early blooms, and does not appear to be serious later in the season. It is felt that cold injury may have been associated with the infection. One grower who has 200 varieties reported that the infection was general on all varieties with the exception of Princeps.

Department of Agriculture, Hobart. - G. C. WADE.

RUST OF ANTIRRHINUM:

During October, 1952, several severely rusted snapdragon plants (*Antirrhinum majus* L.) were brought to the Biological Branch from a Sydney suburban nursery. The symptoms on these plants and the morphological characteristics of the uredospores and teleutospores agree with the description given by overseas workers (e.g. Green, D.E.:Jour.Roy.Hort.Soc. 59:1:119-126, 1934) for the Antirrhinum rust organism, *Puccinia antirrhini* Dietel and Holway and is the first record of this fungus in Australia.

Attempts to eradicate the disease by burning infected and healthy plants in the outbreak area were unsuccessful and, in response to newspaper and radio warnings, many reports of the disease from suburbs several miles away were received. The rust is now widespread in the Sydney area.

Imported antirrhinum seed has been examined and samples from Germany, Holland and France were found to contain an abundance of uredospores, roughly estimated at 1-2 x $10^6$ spores per ounce of seed. Trials are at present under way to determine whether these spores can cause infection when dusted on to healthy plants, for it is believed that the dispersal of spores on to young plants nearby, when the imported seed was being sown, constitutes a possible means by which the disease was introduced.

Further details of this work will be published at a later date.

Department of Agriculture,
Sydney.

- J. WALKER

NOTES ON GLADIOLUS DISEASES:

Horned flowers. Palm & Young (P.D.R., 36:3:108) recorded the occurrence of spurs and cone-like protuberances on gladiolus petals in Oregon, U.S.A. in 1951.

Over the past 4 years numbers of specimens of this type of abnormality have been received from growers in N.S.W. Generally only a few such plants occur in a crop. Another abnormality sometimes seen is the development of thickened narrow petals with or without some spur formation. In a commercial crop at Wyong in 1949 almost 100% of the flower spikes of 3 varieties were affected in this way. In the following season the corms produced by these plants flowered normally. No relationship to hormone injury has been traced in any of the cases investigated.

Vein browning of corms. In corms carrying heavy surface infection of *Sclerotinia gladioli*, a brown discolouration sometimes develops along the veins from the lesions to the core. The fungus has been isolated from the discoloured tissues. The appearance of the corms in cross section is somewhat suggestive of yellows but the browning is more restricted. This vein invasion occurs during storage. It has not previously been observed in N.S.W.

Stemphylium leaf spot. This disease has been reported by several commercial growers during early summer. It occurs only sporadically, but when present causes premature death of foliage and poor flower production. It spreads very rapidly within the crop unless checked by spraying.

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Symptoms are the production of very numerous pale green circular spots 3-4 mm. in diameter on leaf blades and flower stalks. These become light tan and spore production occurs on them as the leaf dies. The red central spot described as a feature of this disease in U.S.A. is only occasionally seen.

The fungus does not appear to differ morphologically from the common Stemphylium botryosum.

Department of Agriculture,
Sydney.

- LILIAN R. FRASER.

# MISCELLANEOUS NOTES.

## ISOLATION OF HELMINTHOSPORIUM AND CURVULARIA SPECIES FROM WHEAT STRAW:

In isolating root and foot rot fungi such as *Helminthosporium sativum* and *Curvularia ramosa* from wheat straw and roots by the agar plate method, difficulty is often experienced with rapid growing saprophytes which tend to over-run the plates. It has been found that this difficulty may be overcome largely by plating diseased tissue on to sterile, moist sand. The basal portions of infected wheat plants are stripped of the enclosing leaf sheaths, cut into 1" - 1½" lengths, surface sterilized in 1: 1000 mercuric chloride in 10% alcohol for 2 minutes and washed once in sterile water. The straw pieces are then plated directly on to the sand in petri dishes, each dish containing 50 gm. of sterile sand previously moistened with 10 ml. of sterile water. Incubation periods of 7-15 days at 25°C. have proved satisfactory.

*H. sativum* and *C. ramosa*, if present, grow out from the straw surface and, because of their characteristic conidiophore development, can be readily detected under a binocular microscope using a 30 X or similar magnification. If pure isolates are required, inoculum can be picked off under the binocular and transferred to agar slopes or plates.

Department of Agriculture,
Sydney.

- F. C. BUTLER.